

Access to treatment of women with breast cancer

Acesso ao tratamento da mulher com câncer de mama

Samara Maria Moura Teixeira Sousa¹, Maria das Graças Freire de Medeiros Carvalho¹, Luiz Ayrton Santos Júnior¹, Sarah Borges Carolina Mariano¹

DOI: 10.1590/0103-1104201912206

ABSTRACT This study was aimed at characterizing the access to treatment of women diagnosed with breast cancer in the state of Piauí, Brazil. A cross-sectional analytical study was developed in two referral hospital institutions from January/2018 to June/2018. The population comprised women diagnosed with breast cancer who underwent treatment in the period from 2016 to 2017. The sample amounted to 155 participants. Sampling was proportionally stratified. The data was processed in IBM® SPSS®, and uni and bivariate statistics were calculated. It was noted that the average time for treatment was of 112.7 (\pm 93.6) days, varying from 12 to 550 days (\equiv 18.3 months or 1.5 years), with 71.6 % of the women starting treatment within a period higher than 60 days following breast cancer diagnosis. Statistically significant associations were verified between the delay to start treatment and the state territory of residence ($p = 0.041$) and the disease stage ($p = 0.037$). The conclusion is that women are not having access to breast cancer treatment as recommended. Therefore, it is worth noting the need for greater organization in the network of health services, taking into account the needs of the population through timely health care.

KEYWORDS Women's health. Breast neoplasms. Health services accessibility. Therapeutics. Time-to-treatment.

RESUMO O objetivo do estudo foi caracterizar o acesso ao tratamento da mulher com diagnóstico de câncer de mama no estado do Piauí, Brasil. Estudo transversal analítico, desenvolvido em duas instituições hospitalares de referência, no período de janeiro a junho de 2018. A população compreendeu mulheres diagnosticadas com câncer de mama que realizaram tratamento no período de 2016 a 2017. A amostra foi de 155 participantes. A amostragem foi estratificada proporcional. Os dados foram processados no IBM® SPSS®, e calculadas estatísticas uni e bivariadas. Constatou-se que o tempo para o tratamento foi de, em média, 112,7 (\pm 93,6) dias, variando de 12 a 550 dias (\equiv 18,3 meses ou 1,5 anos), sendo que 71,6% das mulheres iniciaram o tratamento em um período superior a 60 dias do diagnóstico do câncer de mama. Foram verificadas associações estatisticamente significativas entre o atraso para início do tratamento e o território estadual de residência ($p=0,041$) e o estágio da doença ($p=0,037$). Dessa forma, o acesso ao tratamento do câncer de mama não está acontecendo como preconizado. Ressalta-se, portanto, a necessidade de uma maior organização dos serviços de saúde em rede, levando em conta as necessidades da população, por meio do atendimento em tempo oportuno.

PALAVRAS-CHAVE Saúde da mulher. Neoplasias da mama. Acesso aos serviços de saúde. Terapêutica. Tempo para o tratamento.

¹Universidade Federal do Piauí (UFPI) - Teresina (PI), Brasil.
samaraenfmoura@hotmail.com



Introduction

Breast cancer is a public health issue worldwide. The increased incidence of breast cancer mortality is directly proportional to changes in demographic patterns, such as population aging and economic development. The challenge is to ensure equal and integral access to the diagnosis and treatment of the disease¹. Given the increasing estimate of cancer cases, one should consider factors such as the provision of services and timely access, so that early diagnosis and treatment are possible. Although this disease is considered to have a relatively good prognosis when diagnosed and treated in a timely manner, the mortality rate (13.68/100,000) remains high in Brazil, possibly because it is still diagnosed at advanced stages², which brings back the discussion about access to treatment.

Recent literature understands that access is not simply the use of health services, but the use of services appropriately and at convenient times³. The relationship between access to health services and equity is highlighted as the ability of health systems to respond adequately to citizens' needs. It is in this close relationship that we can ensure the provision of appropriate and timely actions and health services, which are able to respond to the needs and expectations of the citizens⁴.

Thus, the national policy for cancer prevention and control is organized in Brazil, in order to enable the continuous provision of health care actions for the population, through the articulation of different health care centers⁵.

Therefore, the establishment of health care networks in the Unified Health System (SUS), centered in primary care, leads to greater access and regular use of health services with equity⁶.

Given the need to ensure access to cancer treatment, in 2012, Law No. 12,732 of the Brazilian Presidency, which establishes a period of 60 days for the beginning of cancer treatment⁷, was sanctioned.

The data obtained in this study will

contribute to the organization of cancer care services in the state of Piauí. Thus, this study is aimed at characterizing the access to treatment of women diagnosed with breast cancer in the state of Piauí, Brazil.

Methods

This is an analytical cross-sectional study developed in two referral hospitals located in the Teresina, the capital of the state of Piauí, from January to June 2018. Piauí has 3 institutions in the SUS oncology care network, 1 High Complexity Oncology Care Center (Cacon) and 2 High Complexity Oncology Care Units (Unacon). The research was developed in Cacon and in a Unacon, both statewide referral centers. The population of the study comprised women diagnosed with breast cancer, who underwent treatment from 2016 to 2017. In this period, 1,040 new cases of breast cancer were registered, according to data provided directly by the São Marcos Hospital (HSM) and the University Hospital of the Federal University of Piauí (HU-UFPI). The sample comprised women who met the following inclusion criteria: submission of records in the management system and the Brazilian Hospital-Based Cancer Record (RHC). The exclusion criteria were the lack of patient record or the failure to locate the patient after three contact attempts.

To calculate the sample size, we used the formula based on the estimation of the population proportion for finite populations, where N is the population size (1,040), p is the population proportion of the occurrence of the event, in which 13.66% were used, corresponding to the mean prevalence of treatment delay higher than 60 days identified in the literature⁵⁻⁸, Z is the critical point of the normal curve associated with a 95% confidence interval (1.96) and E is the maximum estimation error (5%). Thus, the minimum sample required for the study consisted of 155 participants.

The sampling was stratified proportionally, by subdividing the sample among the institutions with case records: HSM (140) and HU-UFPI (15). For data collection, a list of women who met the inclusion criteria for the selection and sample composition was compiled: the total number of women (1,040) met the inclusion criteria. The selection was carried out through BioEstat 5.0. Those that were not found after three contact attempts were replaced by those selected in a draw, until the minimum sample size was achieved.

For data collection, we used a form containing sociodemographic variables (age, marital status, educational background, color/race, residence, paid work, children, age of first pregnancy, breastfeeding, menarche and menopause), epidemiological variables (previous breast cancer and benign breast diseases), diagnosis and treatment at initial assessment after early symptoms (laterality, tumor size, regional lymph node, presence of metastasis). Operational variables were defined for time to treatment: residence (according to Piauí health territories), place where the treatment began, medical appointment after first symptoms, biopsy, follow-up in primary care, income (paid work, individual income, family income) and stage of the disease.

The research was developed by collecting primary and secondary data through interviews, conducted in person at the hospital. To determine the time to treatment variable, the medical record, which contains the result of the external or internal biopsy, was checked or the patient was asked directly. The exam result was confirmed and compared with the date of the beginning of treatment, either surgery, chemotherapy or radiotherapy. The treatment that began within 60 days after cancer diagnosis was considered adequate, in the light of the Brazilian law called '60-day' Law⁹.

The study data were processed using the IBM® SPSS® software, version 23.0.

Descriptive statistics were calculated (mean and standard deviation, median and interquartile range, minimum and maximum for quantitative variables, and frequencies for qualitative variables). Significance values (p) and correlation coefficient (r) were presented¹⁰.

To verify the relationship between the time to start treatment (more than 60 days vs. up to 60 days) and the selected operating variables, the Pearson Chi-Square Test was performed. When the assumptions of this test were not met, the variables were dichotomized to perform Fisher's Exact Test. For this recategorization, the adjusted residuals of the contingency table were analyzed, by separating the categories into groups according to the percentage trend (for the recommended interval or for more than 60 days).

For significant associations, the Odds Ratio and its respective Confidence Interval (CI) were shown. The contingency table percentages were calculated in the columns, and the variables were interpreted (compared) in the rows¹⁰. All analyses were performed at a significance level of 5%.

National and international ethical standards for research with human beings were met. The study was authorized by both referral hospital institutions and was approved by the Research Ethics Committee of the HU-UFPI, under opinion No. 1,933,576/2017 and HSM No. 2,565,844. All participants read and signed both copies of the Informed Consent Form.

Results

The mean (\pm standard deviation) age of women undergoing breast cancer treatment was 53.6 (\pm 12.4) years, with a minimum of 26.0 years old and a maximum of 82.9 years old. Most were married/had a common-law marriage (89 – 57.4%), were self-declared brown (90 – 58.1%) and had a paid work (108 – 69.7%), whose average individual

monthly income was R\$ 899.43 ($\pm 1,055.32$), with a maximum of R\$ 10,000, while the reported monthly family income averaged R\$ 1,245.85 ($\pm 1,311.35$), with a maximum

of R\$ 10,000. Regarding educational background, the average time of study was 6.9 (± 5.8) years, with a maximum of 20 years, and 28 of them (18.1%) were illiterate (*table 1*).

Table 1. Demographic, socioeconomic, gynecologic and obstetric characteristics of women undergoing treatment for breast cancer (n = 155). Piauí, Brazil, 2018

Feature	M	SD	N	%
Age	53.6	12.4		
Marital status				
Single			27	17.4
Married/common-law marriage			89	57.4
Separated/divorced			17	11.0
Widow			22	14.2
Educational Background (years of study)	6.9	5.8		
Color/race				
White			31	20.0
Black			19	12.3
Brown			90	58.1
Yellow			14	9.0
No Information			1	0.6
Paid Work				
Yes			108	69.7
No			46	29.7
No Information			1	0.6
Individual Monthly Income (R\$)	899.43	1,055.32		
Monthly household income (R\$)	1,245.85	1,311.34		
Occupation				
Maid			25	16.1
Self-employed			21	13.5
Retired			45	29.0
Unemployed			45	29.0
Healthcare benefit			17	11.0
Pensioner			2	1.3
Children				
Yes			136	87.7
No			19	12.3
Age of first pregnancy	22.5	5.3		
Menarche Age	13.5	1.7		
Menopause				
Yes			124	80.0
No			31	20.0
Total	155	100.0		

Source: Research Database, 2018.

M: Mean; SD: Standard Deviation.

From the gynecologic and obstetric perspective, 136 (87.7%) had children, with an average age of 22.5 (\pm 5.3) years old in the first pregnancy, ranging from 14.0 years to 38.0 years; 131 (84.5%) breastfed their child/children, with an average breastfeeding time of 16.6 (\pm 13.5) months, ranging from one month to five years. The average age of menarche was 13.5 (\pm 1.7) years, with a minimum of 10.0 years old and a maximum of 18.0 years old. One hundred and twenty-four (80.0%) reported

being in menopause (*table 1*).

Analyzing the epidemiological characteristics, *table 2* reports that 47 women (30.3%) had previous breast cancer, and 41 (26.5%) had benign breast disease. The predominant diagnosis was neoplasm of the outer upper quadrant of the breast (62 – 40.0%), unilateral left (82 – 52.9%) or right (72 – 46.5%). Regarding the stage of the disease, 71 (45.8%) presented stages IIIA, IIIB, IIIC or IV.

Table 2. Epidemiological characteristics of women who underwent treatment for breast cancer (n = 155). Teresina, PI - Brazil, 2018

Characteristic	M	SD	n	%
Anterior Breast Cancer				
Yes	-	-	47	30.3
No	-	-	108	69.7
Benign breast diseases				
Yes	-	-	41	26.5
No	-	-	114	73.5
Diagnosis				
C50	-	-	17	11.0
C50.1	-	-	29	18.7
C50.2	-	-	27	17.4
C50.3	-	-	6	3.9
C50.4	-	-	62	40.0
C50.5	-	-	4	2.6
C50.8	-	-	3	1.9
C50.9	-	-	7	4.5
Laterality				
Right	-	-	72	46.5
Left	-	-	82	52.9
Bilateral	-	-	1	0.6
Disease stage				
I A	-	-	17	11.0
I B	-	-	3	1.9
II A	-	-	28	18.1
II B	-	-	36	23.2
III A	-	-	27	17.4

Table 2. (cont.)

III B	-	-	27	17.4
III C	-	-	6	3.9
IV	-	-	11	7.1
Interval between symptom onset and diagnosis*	275.1	491.2	-	-
Interval between diagnosis and initiation of treatment*	112.7	93.6	-	-
Greater than 60 days	-	-	111	71,6
Up to 60 days	-	-	44	28,4
Total			155	100.0

Source: Research Database, 2018.

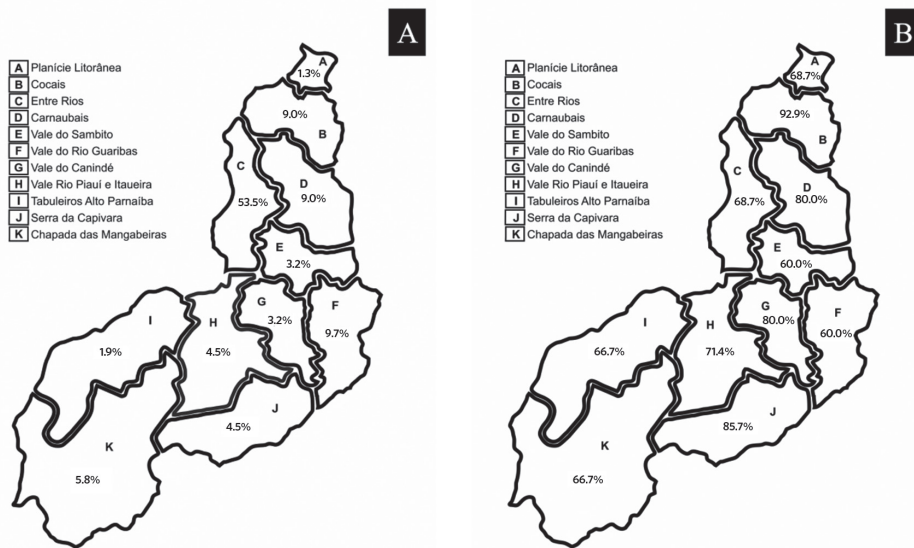
M: Average; SD: Standard Deviation; *: in days.

Regarding the time interval between symptom onset and diagnosis, the mean (\pm SD) was 275.1 (\pm 491.2) days (\equiv 9.2 months), with a minimum of 4 days and a maximum of 4,903 days. (\equiv 13.6 years), and the median (\pm interquartile range) was equal to 122.3 (\pm 279.12) days (\equiv 4.1 months). Regarding the interval between diagnosis and beginning of treatment, the average was 112.7 (\pm 93.6) days, ranging from 12 days to 550 days (\equiv 18.3 months or 1.5 years), median 83.8 (\pm 78.91) days (\equiv 2.8 months), and 111 (71.6%) women started treatment within 60 days of breast cancer diagnosis (table 2).

Figure 1-A shows that 53% of women lived in the territory called Entre Rios,

where the capital of the state of Piauí is located and where there is the highest concentration of high complexity care centers. The frequency of delays of treatment initiation shown in figure 1-B was greater than 59%. The highest percentages of delay were identified, in descending order, among women residing in Cocais (92.9%), Serra da Capivara (85.7%), Carnaubais and Vale do Canindé (both 80.0%), Vale do Rio Piauí and Itaueira (71.4%), Entre Rios and Planície litorânea (Coastal Plain) (both with 68.7%), Chapada das Mangabeiras and Tabuleiros do Alto Parnaíba (both with 66.7%) and Vale do Sambito and Vale do Rio Guaribas (both with 60%).

Figure 1. Distribution of breast cancer cases by health territories of Piauí (n=155). Teresina, PI, Brazil, 2018



Source: Research database, 2018.

A: frequency of breast cancer cases; B: frequency of delay to begin treatment.

Statistically significant associations were found between the time to treatment and the place where the women live, according to state territory ($p = 0.041$) and disease stage ($p = 0.037$). For those from the regions of Cocais, Serra da Capivara, Vale Rio Piauí and Itaueira, Vale do Canindé, Planície litorânea and Carnaubais, the frequency of women who entered treatment in the interval greater

than 60 days was 34 (30.6%), while only 6 (13.6%) began within the period of 60 days. In this relation, the Prevalence Ratio (PR) was 1.269 (95% CI = 1.057-1.524), which shows that women that live in the mentioned territories have a 26.9% greater chance of delay in entering treatment compared to the ones who live in other territories of the state of Piauí (table 3).

Table 3. Association between operational variables and time to begin women treatment (n = 155). Teresina, PI - Brazil, 2018

Variable	Time to begin treatment				p
	>60 days		≤60 days		
	n	%	n	%	
Residence (health region)					0.041^f
Cocais, Serra da Capivara, Vale Rio Piauí e Itaueira, Vale do Canindé, Planície litorânea e Carnaubais	34	30.6	6	13.6	
Entre Rios, Tabuleiros Alto Parnaíba, Chapada das Mangabeiras, Vale do Rio Guaribas e Vale do Sambito	77	69.4	38	86.4	

Table 3. (cont.)

Place of treatment onset					0.131^f
HSM	103	92.8	37	84.1	
HUUFPI	8	7.2	7	15.9	
Appointment after first symptoms					0.593^f
PHC or specialized SUS	55	49.5	19	43.2	
Private or Campaigns	56	50.5	25	56.8	
Performance of Biopsy					0.472^q
Private	70	63.1	25	56.8	
SUS	41	36.9	19	43.2	
Primary care follow-up					0.809^q
Yes	35	31.5	13	29.5	
No	76	68.5	31	70.5	
Paid Work					0.738^q
Yes	78	70.9	30	68.2	
No	32	29.1	14	31.8	
Individual income					0.440^f
Up to R\$ 954.00	8	10.0	1	3.3	
Above R\$ 954.00	72	90.0	29	96.7	
Family income					0.940^q
Up to R\$ 954.00	22	20.6	8	20.0	
Above R\$ 954.00	85	79.4	32	80.0	
Breast cancer stage					0.037^q
Stages I and II	66	59.5	18	40.9	
Stages III and IV	45	40.5	26	59.1	
Total	111	100.0	44	100.0	

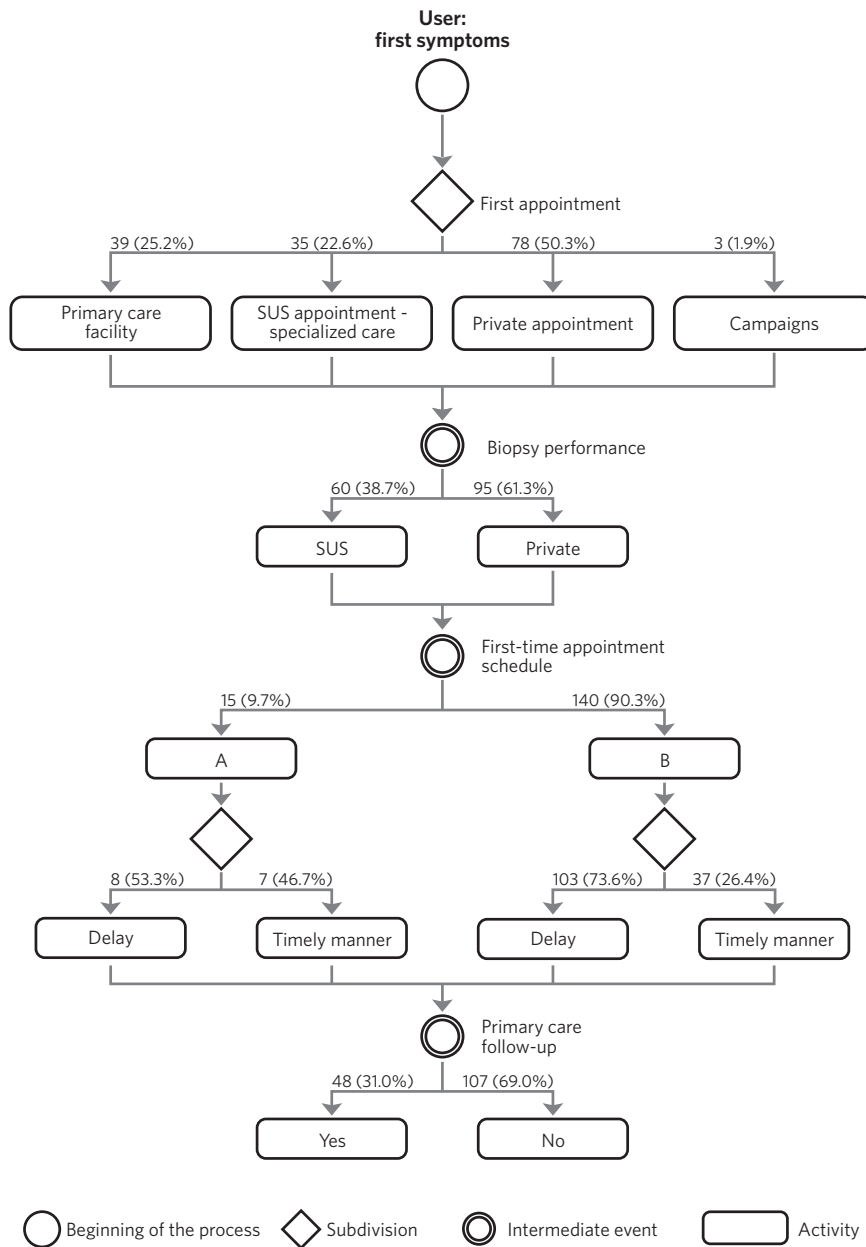
Source: Research Database, 2018.

PHC: Primary Health Care; SUS: Unified Health System; p: significance of the association test; q: Pearson chi-square test; f: Fisher's exact test.

Regarding the stage of breast cancer, the frequency of women with stages I and II who started treatment 60 days after diagnosis was significantly higher, corresponding to 66 (59.5%), with a PR of 1.240 (95% CI = 1.006). -1.528), indicating that women in the early stages of the disease, in which

the tumor is limited to the breast, have a 24.0% greater chance of delaying treatment initiation compared to those diagnosed with stages III and IV. For the other operating variables in the table, no significant associations were found ($p > 0.05$) (table 3).

Figure 2. Flow chart showing women care and biopsy performed on women that entered breast cancer treatment (n=155). Teresina, PI, Brazil, 2018



Source: Reasearch database, 2018.

Figure 2 shows the access flow of the women surveyed after the onset of the first symptoms. Thirty-nine (25.2%) women began treatment in a primary care facility, 35 (22.6%), attended an appointment at a specialized care facility at

SUS. Most of them reported that they searched for private care (78 – 50.3%) and only 3 (1.9%) women began treatment after campaigns. From the total of 155 women interviewed, the majority (95 – 61.3%) reported biopsy

performance in private service. After scheduling first-time appointments, distributed in both institutions, percentages of delay to begin treatment were observed in 103 (73.6%) women of those treated at the state referral cancer hospital and 8 (53.3%) women at the university hospital. There were 107 (69.0%) women who reported that they were not followed by primary care.

Discussion

Most women in the state of Piauí are beginning breast cancer treatment with a delay of more than 60 days after diagnosis, i.e. access is not happening in a timely manner. Consequently, there is a higher percentage of women diagnosed in more advanced stages. In this study, it was evidenced that the cancer care network is not allowing timely treatment for 71.6% of women with this disease in Piauí.

Mean age of women in this study was of 53.6 (± 12.4) years old, close to the averages found in two national studies^{11,12}, 50.5 and 48 years old. In Mexico, one study indicated a mean age of 52 years old, as well as in Rwanda, with a mean age of 49 years old^{13,14}. However, the average was lower when compared to the USA⁶, where the mean age is of 61.6 years old (SD: 15 years), and the mean age is of 75.2 years old in another study⁵, as well as the mean age of France, which is 60 years old⁷.

The study showed a high percentage (71.6%) of women who began treatment at a more advanced stage. This is a severe finding, as detection and early initiation of cancer treatment are related to the higher healing rates of women with breast cancer¹⁵.

This study revealed that the time to establish the diagnosis after abnormality detection was 275.1 days on average. There was a high standard deviation of 491.2 days, and the median was 122.3 days. This delay justifies the advanced staging of the disease, indicating that women treated with this delay may have decreased survival rates. These data are quite

high when compared to the national study¹⁶, in which the average time to diagnosis was 102.5 ± 165.5 days. In Brazil, the ratio between mammograms and screening target population was low in all age groups analyzed¹⁷.

If we compare the time to diagnosis in this study with international studies, the average delay (275.1 days) of this study remains high. In Pakistan, the average is 165 days¹⁸, and in Colombia, the average is 91 days¹⁹. If we compare with countries with greater development potential, this difference becomes even greater. In Mexico, the average was 30 days¹³, in the United States²⁰, it was 16.5 days. However, a systematic review of African studies revealed longer delays than those found in this study, with average time from symptom recognition to diagnosis between 4 months and 15 months²¹.

In a survey conducted in Pernambuco, it was emphasized that the high breast cancer-related mortality in Brazil is related to the delay in the investigation of suspected lesions and the fact that treatment was not initiated in a timely manner. They also reinforce that the purpose of early detection is to diagnose and treat breast cancer patients at an early stage, when the prognosis for long-term survival is better²².

The time interval between diagnosis and initiation of treatment was longer than what is recommended. In this study, we noticed the average delay of 112.7 (93.6) days in a very high frequency of women (71.6%) who started treatment after the period of 60 days. If the time to diagnosis is added to this interval, the average is 387.8 days. The values found in the study are above the national average. As studies²³⁻²⁵ show, the delay was 71.5 days, with a mean of 87.3 days and 68 days, respectively. Another research analyzed the time interval between diagnosis and initiation of treatment for breast cancer in women. The median time between diagnosis and initiation of treatment was 43 days (Southeast: 44 days; Northeast: 43 days; South: 39 days; Central-West: 30 days; North: 49 days)²⁴.

The international literature revealed shorter delays compared to the present study. A study in North Carolina of low-income women found that 66% of them received their first treatment within 30 days after diagnosis, and almost all women (90%) received initial treatment within 60 days after diagnosis⁶.

When the percentages of delay are related to the health territories of the state of Piauí, there is a high percentage in relation to the beginning of treatment in all territories, regardless of the distance from the place where the woman is treated. However, for the territories of Cocais, Serra da Capivara, Vale do Canindé and Carnaubais, the percentage is higher.

It is worth noting that this result is not only related to the most distant territories in relation to the city where Unacon and Cacon are located. In fact, the highest percentage of delay was 92.9%, in the Cocais territory, where its headquarters (Piripiri) is 166.9 km away from the treatment site, followed by Serra da Capivara (São Raimundo Nonato) with a delay of 85.7% and a distance of 521.6 km; Carnaubais 80% (Campo Maior), at a distance of 84 km; and Vale do Canindé with 80% (Oeiras) and a distance of 278.9 km. It is important to highlight that the territory of Chapada das Mangabeiras, 603 km away from the place women seek for treatment, obtained a percentage of 66.7%, below the territory of Entre Rios (68%), where the referral service for cancer treatment is located.

These results show that the delay is not linked to geographical barriers, but may be related to a lack of communication of the care services, that is, to a need to organize care centers, from primary to specialized care, with well-defined flows, as well as the coordination and ordering of services, with primary care as the organizer and coordinator of care. However, there is still a need for further studies to specify what would explain these data.

In the relation between the time to begin treatment and the territories where the women live, the study separated them into two groups,

of which the first represents the territories that showed the longest delays. Thus, those who live in the territories of Cocais, Serra da Capivara, Vale Rio Piauí and Itaueira, Vale Canindé, Planície litorânea and Carnaubais were shown to have a higher prevalence of delay compared to other territories, i.e., there is a 26.9% chance of having late treatment than those who live in other territories.

Regarding the association between the stage and the delay to enter treatment, the time to begin treatment was longer for those who were in the early stages I and II. Therefore, those patients diagnosed at these stages were 24% more likely to begin treatment above the time required by law than those at stages III and IV.

With respect to the design of women's flow from detection of abnormality to treatment and primary care follow-up, it was observed that access to the cancer care network is not as how it was supposed to be. Among the women interviewed, more than half started to search for breast cancer treatment at private service networks. This data may evidence that the network is not meeting the needs of this population. Similar data were found in another study showing that 36% of patients were referred by the family health clinic, and 48% by private service networks²⁶.

Another relevant point on the treatment course is the fact that most women (61.3%) need to perform biopsy in the private network, regardless of entering treatment by SUS or private clinics. In the state of Piauí, only HU-UFPI offers breast cancer biopsy service at SUS. This shows that there is a lack of biopsy offer, which is compatible with another study performed, in which the number of biopsies compared to the number of cases that would require follow-up for diagnostic clarification shows that only 27% of women between 50-59 years old with BI-RADS mammograms 4 and 5 are performing biopsy. In the age group among those between 60-69 years old, this percentage rises to 63%¹⁷.

The same author also demonstrated that

the number of biopsies offered in the network does not correspond to the diagnostic need estimated by the number of mammograms performed in Brazil, which indicates that the health system is not yet prepared to meet the demand of women who should be targeted by specific actions of screening and early diagnosis for breast cancer¹⁷.

In the step following treatment onset, women return to primary care to schedule the first-time appointment at the place of treatment. This happens for women who started the process in the private service. However, those who started treatment at SUS services are already referred to the first-time appointment in the public health service.

It is worth noting that a frequency much higher than half of the interviewees were not accompanied by primary care. According to the Ministry of Health, the relationships between health care centers should be horizontal, with the communication center in primary care being responsible for coordinating and organizing actions²⁷.

The fact that primary care is not coordinating and organizing care, as well as specialized care, which also does not coordinate patient follow-up in their service in a structured way, certainly allows this interruption of treatment. In fact, the woman is the one who seeks alone to address her needs. This suggests that the network is not ordered or coordinated, which may be the fundamental point for her to access treatment in a timely manner.

In a study in Canada, which evaluated time reduction for diagnosis to rapid-access breast clinic, which had coordinated care within diagnostic centers, the time from diagnosis search to treatment initiation decreased from 92 days to 64 days. The study concluded that research coordination decreases duplicate care, as well as the involvement of the family doctor increases the ability to initiate treatment in a timely manner, and that coordination of radiological care improves the wait time and result range²⁸.

Delays in health services are verified when

the care network is unstructured, which promotes the overload of specialized centers and favors undesirable situations, such as adverse selection in favor of the best prognostic cases²⁶.

In Taiwan, the health system does not have a referral and counter-referral system. However, patients have high accessibility to medical care. Each patient can access any service without a primary referral and seek a more complex health service without referral to a less specialized care service. Thus, they start treatment earlier²⁹.

The long wait time for both diagnosis and treatment initiation can have serious consequences for patients, such as decreased chances of healing and survival time. It also brings damage related to quality of life, as it requires more aggressive approaches, the need to use multiple therapeutic modalities, which may result in overlapping sequelae²².

It is important to highlight that appointment and exam regulation in both institutions that participated in this study is performed by the Municipal Health Manager of Teresina, Piauí, through the schedule system available at decentralized appointment sites in Basic Health Units in the municipalities of the state. Thus, in view of the patient's need, this system is scheduled for a first-time oncology appointment, with evidence upon presentation of the biopsy to begin treatment in qualified health facilities, such as Unacon or Cacon.

The access category seeks a concrete totality, based on the principle of equity, in establishing paths for the universality of care, regionalization, hierarchy and popular participation⁴.

Thus, the analysis of the access of women with breast cancer to treatment may provide the basis for the organization of a quality service, so that the treatment of the disease can occur in a timely manner and according to the population's need in order to obtain greater resolution. Studies evaluating the time interval between diagnosis and initiation of treatment are important to direct resolutive measures, as they indicate changes in flow, as

well as list cost-related aspects, contributing significantly to all levels of management, based on the planning of health actions^{8,30}.

More studies are needed to determine more precisely which variables, at each care facility of the cancer care network in the state of Piauí, are interfering in the treatment process of breast cancer patients, as well as a more specific understanding of the whole process in an attempt to discriminate the real impact of each care facility on the cancer care network.

Conclusions

In the state of Piauí, access to breast cancer treatment is not available as recommended by the Ministry of Health. Very significant percentages of women starting late treatment were identified. The flow of access to treatment for this disease is not allowing women to benefit from the care network as determined by the 60-day law, suggesting disarticulation between the services, which could have influenced delays in starting treatment. Therefore, the need for a greater organization of health service networks is emphasized, taking into

account the needs of the population through timely and resolute care, with primary care as an ordinator and coordinator of care, ensuring, therefore, access to treatment and use of treatment resources in the most efficient manner.

Collaborators

Sousa SMMT (0000-0002-9611-7486)* contributed to the conception, planning and design of the study; acquisition, analysis and interpretation of work data; data collection; writing, preparation of preliminary versions of the article and critical review of important intellectual content; final approval of the version to be published. Carvalho MGF (0000-0002-6161-7085)* contributed to the work orientation, relevant critical review of the intellectual content and final approval of the version to be published. Santos Júnior LA (0000-0002-6697-6167)* presented important suggestions incorporated into the work and approved the final version of the manuscript. Mariano SBC (0000-0003-0452-0516)* contributed to the data collection and presented important suggestions incorporated into the work. ■

*Orcid (Open Researcher and Contributor ID).

References

- Oliveira EXG, Melo ECP, Pinheiro RS, et al. Access to cancer care: mapping hospital admissions and high-complexity outpatient care flows. The case of breast cancer. *Cad. Saúde Pública*. 2011; 27(2):317-326.
- Barros AF, Uemura G, Macedo JLS. Interval for access to treatment for breast cancer in the Federal District, Brazil. *Rev Bras Ginecol Obstet*. 2013; 35(10):458-63.
- Mendes EV. O acesso à atenção primária à saúde. Brasília, DF: Conselho Nacional de Secretários de Saúde; 2016.
- Barros FPC, Lopes JS, Mendonça AVM, et al. Acesso e equidade nos serviços de saúde: uma revisão estruturada. *Saúde debate*. 2016; 40(110):264-271.
- Bleicher RJ, Ruth K, Sigurdson ER, et al. Time to Surgery and Breast Cancer Survival in the United States. *JAMA Oncol* [internet]. 2016 [acesso em 2018 jan 10]; 2(3):330-339. Disponível em: <https://jamanetwork.com/journals/jamaoncology/fullarticle/2474438>.
- McLaughlin JM, Anderson RT, Ferketich AK, et al. Effect on survival of longer intervals between confirmed diagnosis and treatment initiation among low-income women with breast cancer. *J Clin Oncol* [internet]. 2012 [acesso em 2018 jan 10]; 30(36):4493-500. Disponível em: <https://ascopubs.org/doi/10.1200/JCO.2012.39.7695>.
- Molinié F, Leux C, Delafosse P, et al. Waiting time disparities in breast cancer diagnosis and treatment: a population-based study in France. *Breast* [internet]. 2013 [acesso em 2018 fev 1]; 22(5):810-6. Disponível em: <https://www.sciencedirect.com/science/article/abs/pii/S0960977613000404>.
- Souza CB, Fustinoni SM, Amorim MH, et al. Breast cancer: diagnosis-to-treatment waiting times for elderly women at a reference hospital of São Paulo, Brazil. *Ciênc. Saúde Colet*. [internet]. 2015 [acesso em 2017 dez 3]; 20(12):3805-16. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232015001203805&lng=en&nrm=iso&tlng=en.
- Brasil. Ministério da Saúde. Lei nº 12.732, de 22 de novembro de 2012. Dispõe sobre o primeiro tratamento de paciente com neoplasia maligna comprovada e estabelece prazo para seu início. *Diário Oficial da União*. 23 Nov 2012.
- Pollock PH. *The essentials of political analysis*. Washington, DC: CQ Press; 2012.
- Veiga DF, Campos FSM, Ribeiro LM, et al. Mastectomy versus conservative surgical treatment: the impact on the quality of life of women with breast cancer. Mastectomia versus tratamento cirúrgico conservador: impacto na qualidade de vida de mulheres com câncer mamário. *Rev. Bras. Saúde Matern. Infantil*. 2010; 10(1):51-57.
- Cavalcanti LPG, Simões PSF, Silva MRR, et al. Assistência em mastologia em uma unidade de referência do Sistema Único de Saúde no Ceará, Brasil. *Rev. bras. Cancerol*. 2012; 58(4):63-69.
- Ángeles-Llerenas A, Torres-Mejía G, Lazcano-Ponce E, et al. Efecto de la demora en la atención sobre la supervivencia de mujeres mexicanas con cáncer de mama. *Salud Publica Mex*. 2016; 58(2):237-250.
- Pace LE, Mpunga T, Hategekimana V, et al. Delays in Breast Cancer Presentation and Diagnosis at Two Rural Cancer Referral Centers in Rwanda. *Oncologist*. 2015; 20(7):780-788.
- Rosa LM, Radünz V, Brüggemann OM. Tempo entre as etapas diagnósticas e terapêuticas do câncer de mama no SUS. *Ciênc Cuid Saúde*. 2013; 12(1):104-111.
- Romeiro Lopes TC, Gravena AAF, Demitto MO, et al. Delay in Diagnosis and Treatment of Breast Cancer among Women Attending a Reference Service in Brazil. *Asian Pac J Cancer Prev* 2017; 18(11):3017-3023.
- Azevedo e Silva G, Bustamante-Teixeira MT, Aquino EML, et al. Acesso à detecção precoce do câncer de mama no Sistema Único de Saúde: uma análise a partir dos dados do Sistema de Informações em Saúde

- de. *Cad. Saúde Pública*. 2014; 30(7):1537-1550.
18. Habibullah S, Haider G, Ashraf J, et al. To Determine the Factors Responsible for Diagnostic Delay of Breast Cancer Among Women. *Pak J Med Res*. 2016; 55(3):62-5.
19. Piñeros M, Sánchez R, Perry F, et al. Demoras en el diagnóstico y tratamiento de mujeres con cáncer de mama en Bogotá, Colombia. *Salud Publica Mex*. 2011; 53(6):478-85.
20. Ruddy KJ, Gelber S, Tamimi RM, et al. Breast cancer presentation and diagnostic delays in young women. *Cancer*. 2014; 120(1):20-5.
21. Espina C, Mckenzie F, Dos-Santos-Silva I. Delayed presentation and diagnosis of breast cancer in African women: a systematic review *Annals of Epidemiology*. *Rev. Ann Epidemiol*. 2017; 27(10):659-671.
22. Paiva C, Cesse E. Aspectos relacionados ao atraso no diagnóstico e tratamento do câncer de mama em uma Unidade Hospitalar de Pernambuco. *Rev. Bras. Cancerol*. 2015; 61(1):23-30.
23. Ferreira NAS, Carvalho SMF, Valenti VE, et al. Treatment delays among women with breast cancer in a low socio-economic status region in Brazil. *BMC Women's Health*. 2017; 17(1):4-11.
24. TCR Lopes, Gravena AAF, Demitto MO, et al. Atraso no diagnóstico e tratamento de cancro da mama entre as usuárias de um serviço de referência no Brasil. *Asian Pac J Cancer Prev*. 2017; 18(11):3017-3023.
25. Kaliks RA, Pontes LB, Bognar CLFB, et al. Pacientes com câncer de mama oriundas do Sistema Único de Saúde tratadas no setor privado: custos de um piloto de parceria público-privada em oncologia. *Einstein [internet]*. 2013 [acesso em 2017 dez 3]; 11(2):216-223. Disponível em: http://www.scielo.br/pdf/eins/v11n2/pt_14.pdf.
26. Trufelli C, Matos LL, Santi PX, et al. Adjuvant treatment delay in breast cancer patients. *Rev assoc med Bras*. 2015; 61(5):411-416.
27. Brasil. Ministério da Saúde. Estimativa 2018: incidência de câncer no Brasil [internet]. 2017 [acesso em 2018 set 29]. Disponível em: <http://www.inca.gov.br/estimativa/2018/estimativa-2018.pdf>.
28. Mckeivitt EC, Dingee CK, Warburton R, et al. Coordination of radiologic and clinical care reduces the wait time to breast cancer diagnosis. *Curr Oncol*. 2017; 24(5):e388-e393.
29. Shieh SH, Hsieh VC, Liu SH, et al. Delayed time from first medical visit to diagnosis for breast cancer patients in Taiwan. *JFMA*. 2014; 113(10):696-703.
30. Graboís MF, Oliveira EXG, Carvalho MS. Access to pediatric cancer care in Brazil: mapping origin-destination flows. *Rev Saude Publ*. 2013; 47(2):368-78.

Received on 03/22/2019

Final version on 08/20/2019

Conflict of interest: non-existent

Financial support: non-existent